

ZERO BEAT

HAMPDEN COUNTY RADIO ASSOCIATION, INC

%%%%%%%%%

Next Meeting:

CHRISTMAS PARTY!

PMARA MTARA HCRA

Smorgasbord Music Door Prizes

Friday, December 2nd, 1983

ELKS BPOE 902
250 Whitney Ave
Holyoke, Mass

\$12. per person

7pm

%%%%%%%%% FOR TICKETS: Bob Gruel 568-3120 %%%%%%%%%%

Hamppden County Radio Association

The HAMPDEN COUNTY RADIO ASSOCIATION is a non-profit corporation of radio amateurs interested in the investigation of the technical aspects of the communication arts. The club is the base for the first call district QSL bureau. We are affiliated with the American Radio Relay League and endorse their programs. The HCRA is a general interest radio club and does not operate any amateur repeaters. The club participates in national radio contests every year, especially the VHF Sweepstakes in January, ARRL International DX Contest in February/March, and Field Day in June. Meetings are held the first Friday of every month, (except July and August) and annual auctions, flea markets, banquets and general interest programs make up the schedule. The association participates in many different programs and almost every operating event listed in QST has at least one club member's call. The club station is W1NY and is in memory of Hank Baier. ZERO BEAT, our club newsletter, has won national awards, and is sent out ten times a year to all members. If you're an active ham and would like to join, we welcome you! Dues are \$8.50 per year, payable every September, and should be sent to Greg Stoddard, N1AEH, 1500 Mapleton Ave, Suffield, Ct 06078

AUCTION REPORT

Our annual club auction was November 4th, with a good turnout of people. The goodies for sale were mostly of the "Classic" (read "JUNK!") variety. **K1BE**, **W1PUX**, **K1ZFE**, and **W1ETS** did the honors as auctioneers. Through the generosity of the members, we made \$167.00 on the affair. It was the donation of several nice items by members, hams like **W1NPL** and **W1ETS**, and items from the estate of **W1VON**, that put us over the top! Many thanks to all. Now we can join AMSAT as a club!

BOARD OF DIRECTORS MEETING REPORT

The Board of Directors meet every Monday after our monthly meeting. On November 7th, we gathered at the beautiful home of our treasurer, **N1AEH**. Many mundane items of club business were discussed. The schedule is all set for the rest of the year. The club is ready to win the January VHF SS. The Flea Market in May will be held at the West Springfield Lodge of Elks. The June banquet will be at the church. The treasury is doing well, with over \$1,000.00, more than we normally have! The Board voted not to co-host or have a Christmas party in 1984. We'll have our regular meeting instead. See the complete schedule on the last page of this issue.

Under new business, a variety of things were brought up. The idea of club badges was suggested, and **K1KPH** will check into it. Door prizes at every meeting was rejected as too expensive. More Public Service activities or participating in the Science Fair again at the Springfield Museum is being investigated. **AC1T** will check on the museum, and **W1GLX** will look into visiting schools, etc. The HCRA is now a member of AMSAT! **K1BE/K1KPH** want more participation in Field Day and will look into new sites, ways of running FD, etc. Any suggestions should be directed to Jeff or Bob.

The ARRL National Convention is in New York City in July of '84. The club is going to rent a bus for a one-day trip to the convention! The New England Division is again having a club newsletter competition and **ZERO BEAT** is going to be entered. **W1HHR**, our division director, is also sponsoring a Ham-of-the-Year contest, and the Board is nominating **W1KK**, **W1H1H**, and **K1GVC** as candidates.

The meeting ended at 10 pm, with much excitement about our newest ideas. It has been awhile since a detailed Board minutes report has been printed in ZB. Does anyone want to read this? Show some interest or forget about seeing these reports. 'Nuff said!

"Quick As A Wink" Printing & Sales Co



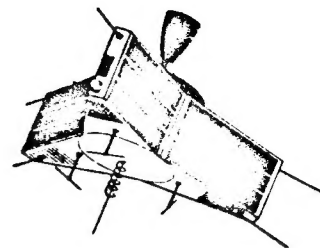
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573 Union Street West Springfield, Ma. 01089

TELEPHONE (413) 736-8184

AMSAT-OSCAR 10

Do you own a two meter USB/LSB rig? Have you heard the new AMSAT OSCAR AO-10? Listen in on these frequencies and get in on the fun!

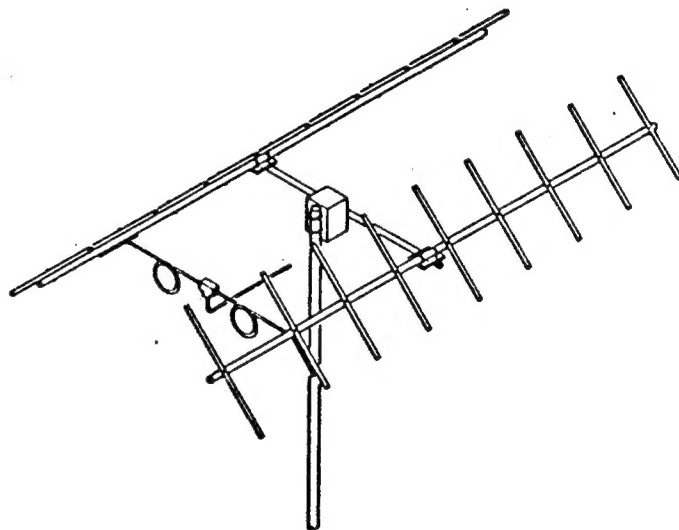


The General Beacon on 145.810 mhz USB will transmit 5 minutes of cw on the hour and half hour, followed by 25 minutes of PSK telemetry. It sounds like a warbling, low frequency rumble. From time to time, the General Beacon will go off the air, and if you tune to 145.987 mhz USB, you'll hear the Engineering Beacon. This is much louder!

The Mode B transponder, (70cm to 2M), should be active and you'll hear cw and SSB communications in progress in the passband 145.840 to 145.960 Mhz. The satellite should be visible for about nine hours a day! Mondays (UTC) are low power (QRP) days. AMSAT requests that we limit our power to 100 watts ERP. On Wednesdays and Saturdays (UTC) for one hour before apogee and continuing for two hours, until one hour after apogee, Mode B is shut off and replaced by Mode L operation, on a temporary trial basis.

There is some interruption of the Mode B orbit currently underway in order to prevent battery drag-down, occasioned by eclipses being experienced by the satellite and the resulting lack of solar re-charge. These shut off intervals on Mode B occur between mean anomaly 220 and mean anomaly 1 which is at perigee. (closest to earth.) Since each full orbit consists of 256 such units, total duration some 700 minutes, the time off is 4 hours and 10 minutes after apogee for a period of some 100 minutes just prior to perigee.

From the accompanying chart, you can see the various channels and beacons on OSCAR 10. The conversion frequency for Mode B is 581.0000 Mhz, so to find out where your Uplink (Transmit) frequency will come out on the Downlink (Receive), just subtract it out. For example, if you transmit on 435.100 Mhz, (conversion minus uplink=downlink) or $581.0000 - 435.100 = 145.900$. (The sum of the f uplink plus f downlink equals 581.000Mhz. Therefore subtract frequency up and get frequency down or vice-versa!) This is exclusive of Doppler shift! So get yourself ready for lots of DX via OSCAR A/O 10!



(Chart is on next page.)

TIDBITS FROM PAST ZERO BEATS-1958

W1JWV had his roof and antennas damaged by high winds...W1STR (now N1PF) profiled in an issue. Has a son five and a daughter 3...The club won for ever and ever the gavel from the Hartford Club in the VHF SS...W1LRE and W1KZU having nightly ragchews on 430mhz...W1FAB received his phone WAS certificate...A Tapehone Converter was the big raffle prize. (What was it???..ed)...President was W1WFL, VP was W1QWJ, secretary, W1STR, and treasurer, who else, but W1LRE...Club name badges made available for .35 cents each....W1DGJ has a new NC-300...W1LRV has a new Valient and an HQ-170...

SEND US YOUR WANT ADS,
COMMENTS, TIDBITS, ARTICLES,
GOSSIP BEFORE THE 15th OF EACH
MONTH.

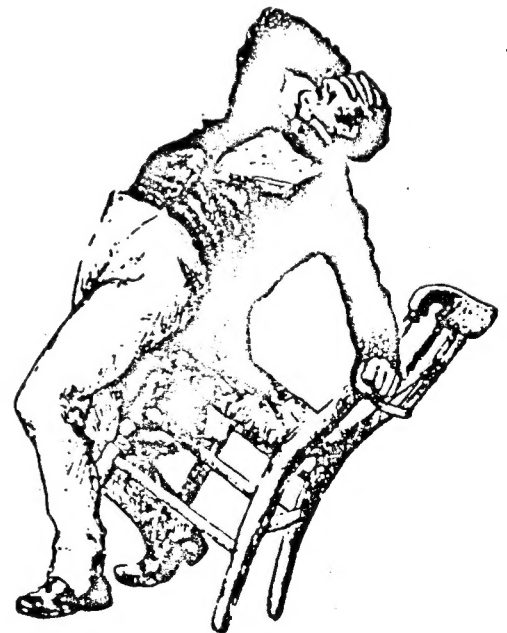
IN THE NEXT ZERO BEAT:

- W1KK's Antenna Polarization article, which he has been very busy researching!
- An AZ-EL rotor system for under \$10. that might work!
- More on OSCAR 10
- STS-9, who worked it?
- VHF Sweepstakes logs/info and much more.....

Mode B Frequency Guide

Exclusive of Doppler shift.

Uplink (LSB)		Downlink (USB)	
		145.937	Beacon, Engineering
435.025	Scheduled Use	145.972	SSC H1
435.035	Scheduled Use	145.965	SSC H2
435.038		145.962	Upper Limit
.040	SSB limit	.960	
.045		.955	
.050		.950	
.055		.945	
.060	center SSB	.940	
.065		.935	
.070		.930	
.075		.925	
.080	begin SSB	.920	
.085		.915	
.090		.910	
.095		.905	
435.100	Center Band	145.900	
.105		.895	
.110		.890	
.115		.885	
.120	begin CW	.880	
.125		.875	
.130		.870	
.135		.865	
.140	center CW	.860	
.145		.855	
.150		.850	
.155		.845	
.160	CW limit	.840	
.162		145.838	Lower Limit
435.165	Scheduled Use	145.835	SSC L2
435.175	Scheduled Use	145.825	SSC L1
		145.810	Beacon, General



" I forgot to renew my membership!

IT AIN'T NECESSARILY SO! by Ed White, W1NPL and K1ZL

An amateur of long standing and close friend complained bitterly when cited for "out of band" operation. After all, he was crystal controlled. How many times have you heard an amateur say he was crystal controlled and sincerely believed that his crystal gives him a certainty that his signal is precisely on frequency, that is, the frequency stamped on his crystal. Unfortunately, it does not.

Crystal control can indeed give high stability and a high Q to a circuit in which it is installed, but it does not follow that the circuit is oscillating or resonant at precisely the frequency of the crystal. Therefore, the radiated signal may easily be outside the band, especially to those who prefer edge of band operation.

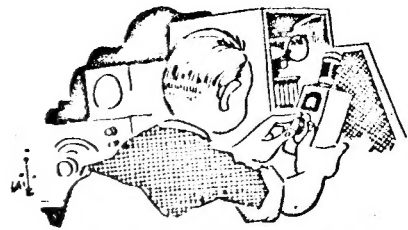
Examining the methods of frequency measurement in common use today, I think it would be safe to say that the old BC-221 frequency meter is not one of the modern methods. However, many have relied on its "accuracy" in the past as a "standard". Its original precision stemmed from the fact that it had been carefully calibrated. But that calibration, which was never linear, can hardly be relied upon when it appeared on the surplus market as a "bargain". Mainly because of ageing and rough treatment, both physical and electrical, of case and/or contents, the accuracy is long gone. Standards like the BC-221 are "accurate only by accident! A simple zero beat check against WWV or CHU, at several frequencies will not make the meter readings precise, as again the BC-221 was never linear.

Let us now go to the modern method of precise frequency measurement. The most common use of measurement of a transceiver is the crystal frequency standard using 100khz harmonics. (And often a divider circuit to produce 25khz and/or 10khz steps in resulting harmonics.) The signal whose frequency is to be measured is zero beat against a signal produced by a crystal oscillator which is zero beat against WWV/CHU. Let's now check this procedure.

First, the crystal itself. Crystals can be purchased with various degrees of "precision". Assume that the manufacturer actually did check our crystal to that order of precision. But under what conditions did he check it? How and with what equipment did he test it? And when did he test it? And what has happened to the crystal since then?

The normal frequency of a crystal depends upon its cut and dimension, though principally on its thickness. Its frequency also depends upon its temperature, likewise its age. The frequency of most crystals tend to increase with age, and at a rate that can only be determined by precise procedures over a rather long period of time. A crystal's normal frequency can also be changed by continued strong stress or vibration, both physical and electrical. But let us assume that we actually do know the exact frequency of the crystal in our rig right now.

What about the circuit in which the crystal is operating--Is it resonant at the crystal frequency? Of course not. In all crystal controlled circuits, the circuit is peaked slightly off of exact resonance, normally on the high side, in order to improve stability



and even with a slight loss of Q.

Even those who use two meter repeaters feel that their crystal is "right on" if the repeater responds. But still the oscillator can be several thousand Hertz off the repeater frequency.

Next consider the temperature of the crystal. Most rigs must "warm up", and a transmitter, even one entirely transistorized, will warm up to a rather high temperature, despite big heatsinks and cooling fans. But what was the temperature at which the crystal was precisioned? And is the rig temperature now within the tolerances of the crystal to maintain that precision?

Let us now look at the practical side. At 4000 khz, using a crystal of $\pm 0.001\%$ precision, the possible error is $\pm 40\text{hz}$. The temperature coefficient will be on the order of 4 Hz per degree Celsius. An increase of 1°C results in a change of 16 Hz at 4000khz. For a 6°C change in temperature, it rises to 96 Hz. As you move up the bands to 20, 15, and 10 meters the multiplier increases rapidly, as does the possible error! Yes, there is some assurance that zero "beating" against WWV will give a precise frequency, but like the old BC-221, is your equipment and/or circuit linear so that when you checked it on 10 mhz or 15 mhz, it is still accurate to work the rare DX station on 14001 or 28500 khz???

In any case, were you really precisely on WWV even at 10 mHz? Did you zero beat by listening? If you are using SSB, you can work both sides of the WWV signal and choose the midpoint. Can you hear a zero beat? Not likely! The human ear can not detect sounds at 30 Hz or less. Most receivers "cut off" at 2-300 Hz, to say nothing of the speaker or headphone response. In short, zero beating with the ear is not a good test.

For greater precision in frequency measurement a visual means is best. Such precision may be obtained by the use of an oscilloscope. But the scope should be checked for identical X and Y amplifier characteristics to give a 45 degree straight line on the CRT.

Admittedly there are now frequency counters that can give precise readings to 0.1Hz. So if you feel you were "right on", you probably were, for the millisecond that your oscillator passed!

So in the future if you receive an "out of the band" notice from an official observer, be relieved, as next time it may be the FCC that spots the violation.

Test your equipment and your ability. Try the frequency measurement test (FMT) conducted four times per year by WIAW. No special forms are necessary. Make the measurements. Report the average and number of readings taken. FMT rules appear in QST the month preceeding the FMT test. Good luck!

*****STS-9 SPACE SHUTTLE LAUNCH SET FOR NOVEMBER 28th! *****

ARE YOU READY?????

GENEROUS HEARTS

We are very fortunate to have had Wes Thayer as such a strong supporter for so many years. Through his years of hard work and careful habits of keeping good records, we now have an almost complete set of **ZERO BEAT** issues going all the way back to the first!!! His widow gave them to George Hughes, **W1ALL**, and he passed them on to me. Editors like Tom Shea, **W1HYO**, Bill Hall, **K1RPB**, publishers like Eunie and Bod Gordon, Tom Barrett, and all the miscellaneous characters that made this club special share that certain something with us! The articles are great and the humor is unique. Many older members come to life in the issues. You'd be surprised how many are still in the club, even since 1948!

What I'd really like to do is to put together a book called "THE BEST OF ZERO BEAT", which would have the better articles, jokes, puzzles, etc from the many years past. Unfortunately, the club operates on a shoestring budget and the Board of Directors could never spend the money. It would cost over \$300.00 to print a 40 page book, 100 copies. Are there any rich members who'd be willing to subsidize it? You would be re-imbursed via sales of the book. (we hope) Contact K1BE if you're interested in the project or if you have money to lend.

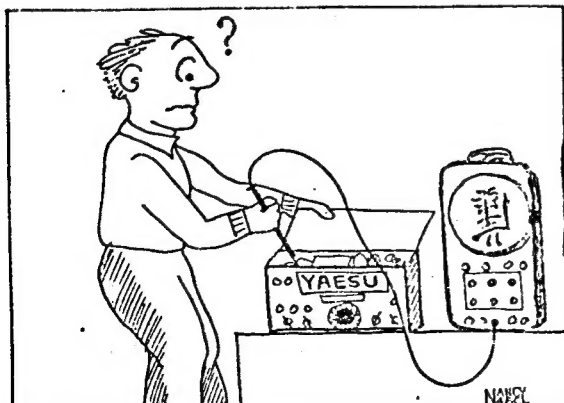
DX-PEDITION!

Would you be interested in running a DX-pedition to a rare area? We'd like to have some of the club members take our club call, **W1NY**, out into the wastelands of Rhode Island during the January VHF Sweepstakes! If you know of a good place to go or have relatives crazy enough to let hams visit, let us know. We have to plan this early, so speak up if you're willing. (Of course, your antenna would only be able to point towards Western Mass...)

FOR SALE: All Drake, complete with manuals: As one unit-TR4CW, serial 43708, Transceiver; RV4C, serial 20828, Remote VFO; AC4, serial 60328, Power Supply All ready to attach to your antenna and you're in business, \$550.00. HUF60 Frequency meter, with manual, TWS-600 \$35.00. NRI Tube Checker, with manual, (like new) \$40.00 Phone 786-2556
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STS-9 IS GO FOR LAUNCH--W5LFL SKED CHANGES

NASA announced November 2 that STS-9 has been rescheduled for launch at 1600 UTC (1100 AM, EST) November 28. Although many of the scientific experiments have been reduced in scope, STS-9 remains a full duration (9 day) mission.

No ham transmissions should be expected from W5LFL before the third day, Wednesday, November 30, or perhaps later if experiment activities are especially heavy.

A substantial number of spacecraft changes have been required as a result of the launch delay. Many of the ham opportunities (see below) occur when the payload bay and Orbiter windows (with ham antenna) are looking at the stars, rather than the earth. However, an adequate antenna "back lobe" may exist to permit communication even in this unfavorable attitude. At any rate, W5LFL will listen and attempt some contacts to see if adequate signal levels are possible.

For the U.S./Canada, the best times for operation will be:

(1) Before the daily "Blue Shift" work begins, from 1300 to 1500 UTC (or 08 to 10 hours EST), along the U.S. east coast.

(2) After the daily "Blue Shift" work schedule is complete, from 0100 to 0300 UTC (1700 to 1900 PST), along the U.S. west coast.

(3) The final full day in orbit, Tuesday, December 6, when the experiment work is almost all complete. Contacts may be possible on any passage near your location between 1300 through 0300 UTC (or 0800 EST through 1900 PST).

Another new alternative will also be attempted by W5LFL. Even though unavailable for hamming while engaged in experiment activities, he will occasionally leave his receiver ON, with one of the ten preselected frequencies set in, while crossing the U.S. For these ten minutes or so, incoming calls will be tape-recorded and played back later on the ground. It is requested that calls "in the blind" be made for no longer than 30 seconds, near closest approach, to give more hams a chance to be heard.

W1AW will be your most reliable, most up-to-date source of information on changes in Dr. Garriott's schedule. Starting with the day of launch (November 28), W1AW will go to its emergency schedule of operation if there are imminent changes in W5LFL's announced operating plans. If there are no changes, W1AW bulletins will be at regularly scheduled times, but when there are changes, W1AW will operate as follows: phone on the hour, cw on the half hour and RTTY on the quarter hour. ARRL Hq. staffers KB1N and KH6WZ will be at the Johnson Space Center in Houston relaying instantly to W1AW any changes in the mission. (Please do not call ARRL Hq. asking for updates.)

Space

Air Force Major General James A. Abrahamson says that NASA will allow UoSAT B to be a secondary payload on the LANDSAT-D' mission, scheduled for launch in February or March 1984. However, some repackaging of UoSAT B will be required before the spacecraft will fit into the Delta 3920 launch vehicle. A "small" cost (\$25,000) will be incurred by NASA to fabricate a special interface/mounting unit to mate the satellite with the launch vehicle. NASA will be reimbursed for this cost.

James McKim, W0CY, reports that Tom Bishop, K0TLM, will be going on a DXpedition with OSCAR 10 gear. Tom will be signing V3CAE and will be operational November 24-29. V3CAE will be a brand-new country and grid square (EK57) via OSCAR 10.

DX

Fiji Islands. 3D2DM, Dale, home call W4BIM, QSL via KE4OC, is regularly on 28543 kHz at 2100Z. Dale is planning a trip to FW, Wallis Island, in December and plans to operate 10 through 20 meters.

Rwanda. Wes, 9X5WD, has been active on 21275 kHz at 2000Z. QSL to WB6VKD.

San Andres. The Colvins are now active from San Andres as W6KG/HK0. QSL to Yasme Foundation.

Mongolia. JT1AO has been on 7010 kHz at 1200Z calling CQ USA and working the east coast.

Thanks to K1XM, K1MM and W1TRC of the Southern New England DX Association.

MANY TNX TO: ARRL LETTER
& THE ARRL

THE HAMPDEN COUNTY RADIO ASS'N. Inc.

SPRINGFIELD, MASSACHUSETTS

PRESIDENT:

STEVE NELSON, WA1EYF
1 MARILYN DRIVE
WILBRAHAM, MASS 01095



HAS AMATEUR RADIO LOST SOME OF ITS' PIZZAZZ!!! FOR YOU??

JOIN A GROUP OF DEDICATED HAMS.....

We are looking for new members that want to belong and support a general interest radio club. Every year we enjoy a variety of projects and topics. Some of them are:

AUCTION

FLEA MARKET

CONTEST COMPETITION AS A CLUB! (Especially VHF Sweepstakes!)

FIELD DAY

LICENSING CLASSES

ANNUAL BANQUET

CLUB NEWSLETTER

CLUB STATION

AND MORE!

The club meets the first Friday of every month, except July and August, at the Feeding Hills Congregational Church, intersection of routes 57 and 187, Feeding Hills, Mass. Dues are only \$8.50 per year, (pro-rated from September for new members).

TIDBITS

FCC had nothing but high praise for amateur radio following the invasion of Grenada. Club member K1IJV was featured on several local newscasts because of the hams on the island...Your want ads are free for members! (\$1.00 for Non-members) To re-run it the following issue, just call and let me know. Mail your ads c/o Zero Beat...WA1YYK and his wife journeyed to California to see the family...The HCRA 10 meter net meets every Thursday night on 28.650 mhz, 9 pm local time...WB1EMN has 295 confirmed in the DXCC...KA1BRD has worked 48 states on 50 Mhz...The HCRA Field Day score was 2,084 points, under 4A in November QST, page 102...WB1FVS and W1VD worked the Perseids meteor shower on 1 1/4 meters...The ARRL 10 Meter Contest is December 10-11th, with a rule change that gives more points for cw contacts this year...Advertise your business in ZERO BEAT! We need the money to underwrite costs and you benefit via sales...K1BE put his new FT726R on the air. Look for a product review in an upcoming issue...WA1ZEV bought himself an IBMpc...Space Shuttle STS-9 is to be launched November 28th. Are you ready? W1RED and K1WVX built the turnstile antenna featured in the last Zero Beat...WA1RWU worked N9AV via moonbounce on 432 Mhz...W1KK operating a Drake TR7A on SSB and a TR5 on CW...

FIRST CLASS

DECEMBER ISSUE

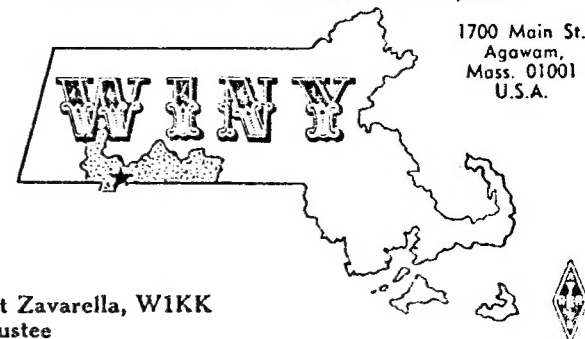
TO:



ZERO SEAT
 Jeffrey J. Duquette
 P.O. Box 346
 Southwick, MA 01077-0346

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Art Zavarella, W1KK
 Trustee

HCRA 1983-84 SCHEDULE OF EVENTS

DATE:	RESPONSIBILITY:	TOPIC:
December 2nd	-----	CHRISTMAS PARTY
December 10-11th	ARRL	10 METER CONTEST
January 6th	AC1T	VHF STATIONS IN NEW ENGLAND; HOMEBREW NIGHT
January 15/16 (est. dates)	VHF	SWEEPSTAKES CONTEST
February 4th	K1KPH	USING THE HOME COMPUTER ON HAM RADIO.
ARRL INTERNATIONAL DX CONTEST		
February 18-19 CW	March 3-4	PHONE
March 4th	AC1T	CB-TO-10 METER FM CONVERSION.
April 2nd	K1BE	RADIO REVIEW NIGHT; HOMEBREW NIGHT
May (Saturday)	W1ZKT	FLEA MARKET
June 3rd	N1AFY/N1AEH	ANNUAL BANQUET
June 23rd/24th	ARRL	FIELD DAY!!!!
July 20-22nd	ARRL	NATIONAL CONVENTION, NEW YORK CITY, NY
(SUBJECT TO CHANGE)		